WTCI-711-P

Cheri Sawyer

From: Bhol, Saroj [sbhol@panynj.gov]
Sent: Thursday, May 27, 2004 3:20 PM
To: 'Shyam Sunder'
Cc: jason.averill@nist.gov; james.lawson@nist.gov; cauffman@nist.gov; cheri.Sawyer@nist.gov; Begley, James; Fadavi, Ali; Lin, C. John; Lombardi, Frank
Subject: RE: Information on WTC Roof Rescue Policies

Shyam,
Please see the attachment for the information you requested. I am also attaching a copy of Alan Reiss's statement to 9/11 Commission.
Thanks
Saroj

-----Original Message-----
From: Shyam Sunder [mailto:sunder@nist.gov]
Sent: Monday, May 24, 2004 5:17 PM
To: Bhol, Saroj
Cc: jason.averill@nist.gov; james.lawson@nist.gov; cauffman@nist.gov; cheri.Sawyer@nist.gov
Subject: Information on WTC Roof Rescue Policies

Saroj,

Could you please let us know what the Port Authority's policy was with regard to roof rescue in a building incident at the WTC site.

What was the policy with regard to locking of the doors to the roof and the need for a key to gain roof access?

How were the roof doors designed? Are there documents describing the three-stage "man-trap" referred to by Mr. Alan Reiss in his testimony to the 9/11 commission?

Did any fire safety procedures call for opening these doors, e.g., by someone on a "key run"?

Was it standard evacuation procedure requiring occupants only to exit at the bottom of the WTC towers using the stairwells?

Were any policies with regard to roof rescue changed after the 1993 bombing? What were those changes?

Thanks.

Shyam

Dr. S. Shyam Sunder
Acting Deputy Director
Building and Fire Research Laboratory

711-P

Response to NIST's Questions on WTC Roof Access Policies

What was the policy with regard to locking of the doors to the roof and the need for a key to gain roof access?

Standard evacuation procedure was to always evacuate downward. Tenants were never advised to evacuate upward. Two of the three staircases went up to the 110th floor to serve as the exit stairs from the center corridor on this floor. Tenants however would not have been able to reach the 110th floor center core hallway where the doors to the roof stairs were located since the fire stairwell doors on this floor were non-reentry doors back onto the floor. The 110th floor like many other floors was a non-reentry floor, marked in accordance with the NYC Building Code requirements. It required either a World Trade Center ID to activate the release on the door lock or a key. These access cards were issued to regularly stationed broadcaster staff and also worked on the lobby turnstiles or freight elevator to the 110th floor, which was also access-controlled. Building contractor staff such as electricians or window washers also had stairway door keys. These 110th floor stairway doors were labeled inside the stairway as "NO Re-entry," with the closest re-entry floor indicated on a sign. Even if an individual made it to the 110th floor center corridor, access to the roof was restricted in accordance with Federal Communications Commission regulations, since it housed critical communications equipment, including broadcast facilities for all the major TV stations, paging transmitters, FDNY transmitters and numerous other mobile transmitters. Anyone working on the roof had to take a radio frequency hazard awareness class and be certified to access the roof. Physical access to the roof was through a set of two doors, essentially a mantrap. A small group of individuals had access card privileges, which would open the first door to the roof; and they then would present their ID card and themselves via CCTV and the second door was electronically unlocked open by the Operations Control Center. Most land mobile radio technicians, not on the authorized list, had to present their IDs at the Operations Control Center and then be escorted to the roof.

How were the roof doors designed? Are there documents describing the three-stage "man-trap" referred to by Mr. Alan Reiss in his testimony to the 9/11 commission?

The Port Authority does not have the security drawings and these doors were pre-existing. As shown in the architectural drawings for the 110th floor, there was a separate set of stairs that went from the roof to 110th floor, just past the elevator #99 and the entrance to the elevator machine room. The first door was a door flush with the center corridor. When it opened, it allowed entry to an alcove that had standpipe connect manifold for the roof and a door right in front of the stairs to the roof. This door was at 90-degree angle to the center corridor door and had RF hazard warning signs on it, etc., as required by the FCC. Both doors had TV cameras monitoring them, so if remotely activated, you knew who you were letting up to the roof.

These doors and the "no reentry" doors to the 110th floor had a card access system made by kidder in 1985. According to a retired electrical supervisor, they were installed in 1983 along with same system on mechanical rooms etc. They were replaced with the new permanent security system card readers and electrical door locks post 1993. These locks were UL listed and allowed egress in one direction such as off the 110th floor into stairs. They were electrically activated by card access system but also had key cylinder so incase of system failure, the key would withdraw the lock bolt to allow door to be opened.

So the roof doors were arranged to prevent unauthorized access up to the roof but allow unrestricted movement downward to exit stairs eventually.

Did any fire safety procedures call for opening these doors, e.g., by someone on a "key run"?

Yes there was always a key run at the fire command station to give FDNY any master keys they needed or have the doors electronically released. No those doors were not normally released but on 9/11 the order was given to electronically release all the doors that the 22nd floor SCC controlled including these roof doors, unfortunately, from the radio transcripts it appears that they did not respond possibly due to fiber cable damage. Fiber ran up the center of the building. See channel X and radio communications between S5 and 22nd floor command center.

Was it standard evacuation procedure requiring occupants only to exit at the bottom of the WTC towers using the stairwells?

Evacuation protocols and fire drills followed New York City Fire Department guidelines to always evacuate downward using the stairwells. Tenants were instructed during drills to evacuate to 3 floors below the fire and await further instructions, FDNY procedures do not want a full scale evacuation out of the building for normal events and the information they require be discussed at drills doesn't deal with massive terrorist attacks. Please see the attached written statement by Alan Reiss, submitted to 9/11 Commission, for more thoughts on lessons learned.

Were any policies with regard to roof rescue changed after the 1993 bombing? What were those changes?

There were no changes related to roof rescues after 1993. The WTC Life safety/fire safety director attended meetings between FDNY/NYPD and it was decided that roof rescues were not an option so it was never added or mentioned at fire drills.

Evacuation protocols did not change after 1993, but training and equipment certainly did. Tenants took the fire drills much more seriously after 1993. Prior to then, not everyone would halt meetings or leave trading desks to attend drills despite their floor warden's urging. PA made a video to insure consistent floor warden training. The video

specifically addressed this issue, instructed wardens not to argue, and to report the fact that the persons refused to participate or evacuate. PA purchased red hats, whistles, flashlights, etc., for fire teams on the floors.

Managers received a loose-leaf tenant manual prior to moving in; one section dealt with fire safety and the tenant's responsibility under the NYC Building Code's local law 5 to have a fire safety team. Fire drills were conducted for full floor tenants shortly after move-in and all floors had drills at least twice a year. Approximately two weeks before the drills began, a written notification was hand-delivered to all tenant fire safety team members explaining the process, date, time, etc. These were required to be signed for, so that there was a record of their receipt. On the date of the drill, a representative from the WTC fire safety unit would be positioned on each of the participating floors to observe. They also used the opportunity to test the pull stations. After the drill was conducted, all tenant fire safety team members would gather for a meeting/critique.

Fuji Bank in 2 WTC, floors 78-81, had an effective evacuation plan after 93. They trained their staff, put a little bag under each chair with flashlight and dust mask. PA was informed that after 93 they did practice walking down a few flights, not all the way down.

Statement by Alan Reiss
National September 11 Commission
May 18, 2004

Thank you Chairman Kean, Vice Chairman Hamilton and distinguished members of the Commission for the opportunity to testify before you today. My name is Alan Reiss and I am currently the Deputy Director of Aviation at The Port Authority of New York and New Jersey. Prior to assuming my current position, I was the Director of the agency's World Trade Department, which operated the World Trade Center. Mr. Chairman, I know that you are familiar with the Port Authority, but for the benefit of the other members of the Commission, The Port Authority of New York and New Jersey operates many of the busiest and most important transportation links in the New York-New Jersey region. Most important to the Commission's work, the Port Authority built and operated the World Trade Center and continues to own the 16-acre World Trade Center site in Lower Manhattan.

September 11th was without a doubt the worst day in the long history of The Port Authority of New York & New Jersey and one of the worst in the history of the United States. This was a profound personal loss for us at the Port Authority. The World Trade Center was our headquarters and 84 members of the Port Authority family died that day; 16 of them civilian building management staff who reported to me and responded to their emergency posts that day. We grieve their loss, and our hearts continue to go out to their families, and to the families of all the victims who died that day. We also grieve with the families of the firefighters, police officers, rescue workers, and military personnel who made the ultimate sacrifice to keep our country safe.

As each of you know, the attacks of September 11 were not the first time that the World Trade Center was targeted and attacked by terrorists. On February 26, 1993, terrorists detonated a bomb in the subgrade parking levels of the Trade Center, killing six people, including four Port Authority employees, one of whom was pregnant, and injuring thousands. Port Authority landmark facilities, such as the Lincoln and Holland Tunnels and the George Washington Bridge have been identified as specific targets, along with other New York City landmarks, by terrorist organizations.

While our agency's primary mission is to promote commerce and economic development in our region, the everyday realities within which we operate dictate that safety and security is our number one priority. Given our agency's experiences and our priorities in the areas of safety and security, I am pleased to have the opportunity to provide you with information about the life-safety systems in place at the World Trade Center on September 11 and how they, along with the extraordinary and heroic efforts of both uniformed and civilian personnel contributed to the one of the largest, safest evacuations of tens of thousands of workers and visitors at the World Trade Center on that fateful morning.

INCIDENT COMMAND

The Port Authority adopted the Incident Command System in the 1980s as the way of managing all incidents at its facilities such as the World Trade Center and the metropolitan area airports. Port Authority or New Jersey State Police trained all World Trade Department operations staff and the majority of senior staff, more than 26 people in the World Trade Department alone, in the use of the Incident Command System so we could work with uniformed responders as an effective team.

The World Trade Center had a written emergency procedures manual that dealt with numerous types of emergencies and it has been made available to this commission. This manual was updated and revised every year as a joint effort between World Trade Center operations staff and the Port Authority Police. As the world changed over the last decade, so did the emergency manual and training.

The Port Authority Police held annual tabletop drills involving both police and the civilian management at the World Trade Center to exercise these plans and its decision-making. PAPD specialists developed these exercises. Training was not restricted to just Port Authority employees. For example, New York City fire companies downtown were given regular familiarization tours of the World Trade Center and simplified subgrade floor plans.

The Port Authority Police and World Trade Department staff enjoyed a close working relationship with the New York City Fire Department. Port Authority Police radios were given to Engine 10/Ladder 10 and Battalion 1 in the 1980s to improve communications between the Fire Department and Port Authority Police located at the World Trade Center. Additional police radios were made available to responding units to ensure effective communications between the command post and the incident. After the 1993 attack, we installed a repeater on the Fire Department Citywide radio frequency to aid in communications. Port Authority Police and the Fire Department even drilled together at the World Trade Center, including a simulated five-alarm, full floor fire on the 92nd floor of 2 WTC on June 6, 1999. This drill on an early Sunday morning used smoke machines, mannequins and lighting to create a realistic environment for those involved. In addition, the Fire Department high-rise unit would perform annual inspections that typically took more than a week.

Incident Command training and drills were also done on a multi-agency basis. Just weeks before 9/11, all PA executive staff, including myself, participated in the "Gateway 2000" tabletop exercises at the Port Authority Technical Center in Jersey City and Newark Liberty International Airport with dozens of local, state and federal agencies on a simulated Weapons of Mass Destruction attack at Port Newark. This exercise tested the participants' ability to work under a unified command structure as the situation evolved.

FIRE SAFETY PLANS AND STAFFING

Six weeks prior to the September 11 attacks, the World Trade Center was net leased to a private developer, Silverstein Properties, which began managing the facility with its own executives. I, and a select group of Port Authority employees assisted Silverstein staff during a three-month transition period. Nevertheless, it is vital for the Commission to understand the nature of Port Authority policies and procedures that were implemented and utilized that day and why so many PA staff, even those not on the Silverstein transition team, immediately responded to their former battle stations, as they had been trained to do over the years.

The Port Authority developed and filed with the Bureau of Fire Prevention, a Fire Safety Plan for the WTC buildings in accordance with the bureau's guidelines. Port Authority operations supervisors were certified by FDNY as fire safety directors. They were on duty around the clock at the World Trade Center, as were additional contract FDNY-certified and dedicated deputy fire safety directors who staffed the fire command stations in the tower lobbies 24 hours a day and seven days a week. The sole job of each deputy fire safety director was to staff the fire command station. A separate elevator starter was on duty watching the vertical transportation system, unlike in many buildings where the starter also assumes the fire safety director functions. We felt it was extremely important to have this dedicated fire safety staff. Each of these individuals passed an on-site examination given by the New York City Fire Department before being qualified to work at the World Trade Center.

Prior to the net leasing of the World Trade Center to Silverstein Properties, the Port Authority's life safety supervisor was the complex's top fire safety director. He updated the Emergency Procedure Manual annually, oversaw the fire drills and training, and conducted the familiarization tours and exercises with FDNY. He held a Bachelor of Science in Fire Safety and an MBA, as well as numerous professional certifications. The floor wardens and their fire safety team members received specific training on their responsibilities, including a videotape to ensure consistency in training, red hats, flashlights, and whistles, all above and beyond what local law required.

The Port Authority had standing plans for the full-scale evacuation of the World Trade Center during non-fire events, which the New York City Department of Buildings' World Trade Center Building Code Task Force now recommends for all high-rise buildings. These were used successfully on a number of occasions. For example, the WTC complex experienced a total loss of power due to the Con Edison South Street Seaport Substation fire on August 13, 1990, at 1:15 p.m., and staff successfully evacuated the entire complex of approximately 70,000 people that day in safe manner, including more than 600 people stuck on 40 elevators.

WORLD TRADE CENTER SECURITY/LIFE SAFETY SYSTEM UPGRADES

The 1993 terrorist bombing was a wakeup call to the nation. The Port Authority, at the direction of its Board of Commissioners and the Governors of New York and New Jersey, hired premier experts to help it evaluate and upgrade its life safety and security systems. The 1993 terrorist attack disclosed various issues, such as loss of the fire alarm public address system due to damage from the explosion; failure of emergency generator cooling systems; subsequent loss of all lighting in stairwells when Con Edison power was turned off to allow fire to be fought; confusion in transfer floor exit passageways; and difficulties with the FDNY radio communications within the complex.

To address these issues, the Port Authority's Board of Commissioners authorized more than $130 million in various upgrades to the complex. These investments included the installation of a 2 million watt, tertiary backup power system fed from the New Jersey Public Service Electric & Gas grid utilizing feeders from the PATH rapid transit system. This would take over after loss of both normal multiple Con Edison feeds and emergency generator power. We added battery packs to every other fluorescent light fixture in the exit stairs, as well as to the elevator cab lighting and alarm bells, and within the fire alarm system cabinets. We added photoluminescent paint to stairwells and handrails to guide evacuees, and added glow-in-the-dark floor signs and trailblazing signs at horizontal crossovers. The Port Authority purchased evacuation chair stretchers for any mobility-restricted person working at the World Trade Center because in 1993 fellow employees carried some people down more than 60 stories.

After 1993, the Port Authority consulted with security experts and spent more than $50 million on perimeter and building-access security upgrades at the World Trade Center. The parking lots and truck docks were protected with Delta barriers that could stop a moving truck and prevent its entrance until it was cleared. This type of protection was unheard of at commercial office buildings in 1993. Truck drivers and their IDs were photographed while guards conducted visual inspections of trucks entering the truck dock while PAPD and explosives-detection dogs provided random inspections of the trucks. The perimeter of the World Trade Center complex was ringed with 10,000-pound planters to prevent a vehicle-borne improvised explosive device from getting close to the buildings. The World Trade Center, which had been an open public complex, including its buildings, was converted into a closed building complex where all tenants were issued ID cards and all visitors had to be verified at a visitor desk, where they were photographed and given temporary IDs. Cameras monitored the perimeter for stopped vehicles and more than 200 cameras were installed throughout the complex. A new Security Command Center was built on the 22nd floor of 1 WTC, backed up by a new Operations Control Center on the subgrade B1 level at 2 World Trade Center.

The new Operations Control Center was approximately five times larger than the one damaged by the 1993 bombing, and located as far from the truck docks as possible. It was located under 2 WTC because our security experts told us the highest threat was an improvised explosive device. The Port Authority also invested more than $70 million installing new decentralized fire alarm systems with redundant communication circuits

and control panels, a main one in the lobby of each building and a second in another location.

A quick recap of life safety and security-related improvements installed in the last decade at the World Trade Center shows that the Port Authority invested over a quarter of a billion dollars since 1993.

Concourse Improvements	$34 million
Tower Sprinklers (started pre 1993)	68 million
5,000 LED Exit signs with batteries	1.1 million
2,500 battery packs for stairway light fixtures	1 million
Tertiary backup power from PSE&G	2 million
New Police Command Center	7 million
New Class E Fire Alarm systems	70 million
Perimeter Security	3.8 million
Parking Security	4.3 million
Lock and Key system	1.6 million
Permanent Security System	44.5 million
Parking Access Control System	3.9 million
New Operations Control Center (B1)	11.5 million

RADIO COMMUNICATION

Following a multi-agency critique at One Police Plaza of the response to the 1993 terrorist attack, it was evident that FDNY radios did not work satisfactorily, either below grade within the World Trade Center complex or high up in the towers. I worked with the New York City Fire Department on its needs, secured Port Authority funds and installed a repeater system on FDNY's VHF Citywide channel.

This system was tested by FDNY and found to provide excellent communication throughout the complex. It was normally left off and activated by the fire chief when required. At the request of FDNY, we also added a UHF repeater for the fire department when it decided to go to new digital radios. In light of transmissions recorded on Dictaphone tapes recovered from the site, it appears that the repeater system functioned as intended for those who utilized it on September 11th. When requested by Commissioner Scoppetta, we provided detailed information to FDNY on the World Trade Center repeater system, since it may serve as a model for future systems required in high-rise buildings in New York City. This is one of the recommendations of both the Building Code Task Force and the McKenzie Commission.

FIRE DRILLS

Evacuation protocols did not change after 1993, but training and equipment certainly did. The fire drills subsequent to 1993, and even in 2001, still followed New York City Fire Department guidelines to always evacuate downward since toxic hot gases and smoke rise. In fact, part of the fire drill announcement was: "... had this been an actual emergency, you would have been directed to evacuate to at least three floors below

your floor..." My opinion is that tenants took the fire drills much more seriously after 1993. Prior to then, not everyone would halt meetings or leave trading desks to attend drills despite their floor warden's urging. Our video specifically addressed this issue, instructed wardens not to argue, and to report the fact that the persons refused to participate or evacuate. Managers received a looseleaf tenant manual prior to moving in; one section dealt with fire safety and the tenant's responsibility under the NYC Building Code's local law 5 to have a fire safety team. Fire drills were conducted for full floor tenants right after they moved in with their full staff, and were conducted semiannually for typical office floors, and more frequently for staff of the observation deck, Windows on the World, and the Children's Discovery Center Day Care. Tenant fire drills were typically conducted in the spring and fall and scheduled to maximize tenant participation.

Approximately two weeks before the drills began, a written notification was hand-delivered to all tenant fire safety team members explaining the process, date, time, etc. These were required to be signed for, so that there was a record of their receipt. On the date of the drill, a representative from the WTC fire safety unit would be positioned on each of the participating floors to observe. They also used the opportunity to test the pull stations. After the drill was conducted, all tenant fire safety team members would gather for a meeting/critique.

ROOFTOP EMERGENCY EVACUATION

As previously stated, standard evacuation procedure was to always evacuate downward. Tenants were never advised to evacuate upward. In answer to your question, two of the three staircases went up to the 110th floor to serve as the exit stairs from the center corridor on this floor. Tenants however would not have been able to reach the 110th floor center core hallway where the doors to the roof stairs were located since the fire stairwell doors on this floor were non-reentry doors back onto the floor. The 110th floor like many other floors was a non-reentry floor, marked in accordance with the NYC Building Code requirements. It required either a World Trade Center ID to activate the release on the door lock or a key. These access cards were issued to regularly stationed broadcaster staff and also worked on the lobby turnstiles or freight elevator to the 110th floor, which was also access-controlled. Building contractor staff such as electricians or window washers also had stairway door keys. These 110th floor stairway doors were labeled inside the stairway as "NO Re-entry," with the closest re-entry floor indicated on a sign. Even if an individual made it to the 110th floor center corridor, access to the roof was restricted in accordance with Federal Communications Commission regulations, since it housed critical communications equipment, including broadcast facilities for all the major TV stations, paging transmitters, FDNY transmitters and numerous other mobile transmitters. Anyone working on the roof had to take a radio frequency hazard awareness class and be certified to access the roof. Physical access to the roof was through a set of two doors, essentially a mantrap. A small group of individuals had access card privileges, which would open the first door to the roof; and they then would present their ID card and themselves via CCTV and the second door was electronically unlocked open by the Operations Control Center. Most land mobile radio technicians, not on the authorized list, had to present their IDs at the Operations Control Center and then be escorted to the roof.

Although a few rooftop evacuations did occur in the aftermath of the 1993 bombing, it is my understanding that they were considered and dismissed during a subsequent review by New York City Police and Fire departments for the potential use of helicopters for high-rise evacuations. No such protocol was in place on September 11th. In addition, there were no regular helicopter landings on the roofs of either tower, although there was a small helipad on the roof of Tower Two, which also had the outdoor observation deck platform and some broadcasting antennas. Tower One had the main TV mast and antennas and equipment.

BUILDING CODES

As a bistate agency, under the law, the Port Authority is not subject to municipal code requirements. However, the Port Authority's longstanding policy was and is to meet or exceed all municipal building and fire codes in all of the agency's facilities and to allow inspectors to enter our facilities unannounced.

The 1968 NYC Building Code was used as the basis of design of the WTC towers. As a part of the federal building and fire safety investigation of the World Trade Center, the study of the original design documents by the National Institute of Standards and Technology (NIST) has confirmed this. The December 2, 2003 NIST status report to its advisory committee states, "PONYA adopted 1968 NYC Building Code for final design of WTC 1 and WTC2, and WTC 7." PONYA stands for Port of New York Authority, the agency's name until 1972.

The World Trade Center towers also complied with all subsequent code changes by New York City that were retroactively applicable to existing high-rise buildings, e.g., sprinklerization as an alternative to compartmentation of floor areas, class E fire alarm system, etc.

The World Trade Center towers conformed to the code as evidenced in the World Trade Center Building Performance Study by Federal Emergency Management Agency, which states: "The study did not reveal any specific structural features that would be regarded as substandard, and, in fact, many structural and fire protection features of the design and construction were found to be superior to the minimum code requirements."

Where literal conformance was not feasible, accepted engineering practices and engineered solutions to meet the intent of the code were implemented. In the mid-1990s, due to increased pedestrian traffic on its concourse, which was also the access to the PATH system and various subway lines, and due to increased pedestrian traffic to the World Financial Center, the Port Authority performed a Concourse Life Safety study. The results were reviewed with the NYC Department of Buildings, after which we converted rentable retail space into new exit corridors to ensure that the concourse could be evacuated quickly. We also completely sprinklered and installed a class E voice communications fire alarm system throughout the concourse. These life safety improvements cost more than $34 million, not counting the loss of retail space.

The Port Authority has put this policy in writing. In 1993, the Port Authority signed Memoranda of Understanding with the New York Fire Department and the city's Department of Buildings that commits the Port Authority to comply with the city's building and fire codes. This approach has been endorsed by the New York City Department of Buildings' World Trade Center Building Code Task Force, which wrote in a February 2003 report:

> While not necessarily required to comply with NYC Building Code, buildings within New York City geographical boundaries such as diplomatic missions, federal government buildings and those of other quasi-governmental authorities should ensure that their facilities meet NYC Code requirements. This can be accomplished through a memorandum of understanding and other types of inter-governmental collaboration.

Both of the Port Authority's Memoranda of Understanding with New York City continue in effect, and apply to all new construction at the World Trade Center site and all other Port Authority projects in the city. In addition, the Port Authority's net lease with Silverstein Properties for the World Trade Center explicitly requires that it meet municipal codes. The requirements of the net lease continue in effect as well.

Silverstein Properties and the Port Authority are demonstrating their continuing commitment to safety and security in the rebuilding of 7 World Trade Center, across the street from the 16-acre World Trade Center site. In collaboration with the New York City Department of Buildings and the FDNY, this building will include enhancements that exceed building and fire code requirements, as well as state-of-the-art safety and security technologies. The standards applied to 7 World Trade Center will be applied to all new construction at the World Center site and are expected to serve as a model for construction of safe and secure buildings across the nation.

The Port Authority has agreed to the establishment of a "peer review" process, in which experts would independently review building plans for the World Trade Center site. Also, the Port Authority is encouraging New York City to conduct unannounced building and fire inspections at 7 World Trade Center and throughout the 16-acre World Trade Center site, during construction and the operation of the buildings.

NET LEASE TRANSITION

With the net leasing of the World Trade Center to Silverstein Properties in July 2001, the Port Authority's role in managing all aspects of the complex changed substantially. We assembled a transition team of World Trade Center management and operations staff to advise and assist Silverstein Properties personnel in assuming their roles and responsibilities at the complex. Silverstein Properties hired or reassigned staff, including a fire safety director, a maintenance manager, an operations manager, and a director of security. The transition team worked closely with these individuals and others to educate them about the details of the various systems and procedures in place at the World Trade Center.

Mr. Chairman, on the morning of 9/11, I was on the World Trade Center Concourse when the first plane hit. I responded immediately to the World Trade Center Police Desk, which was in the immediate vicinity on the plaza level and was told that the police had a report that a missile had been fired at the World Trade Center from the Woolworth building. A PA detective and I immediately left the police desk and headed out to the plaza through Five WTC to see what had really happened. We observed the north face of the north tower with a large gash across it and multiple floors fully engulfed in flames. We realized that this was not a missile, based on what our minds could conceive of the damage, and then we noticed part of a large plane's wheel assembly on the plaza. We dragged the assembly back to the police desk and informed the desk officer that a large commercial plane had hit the tower. I then assisted the desk officer in answering calls, checking with the fire command stations and OCC and keeping the desk officer informed as to the situation. We were stunned when 2 WTC was also hit by a plane. The police officers and I rushed to the rear emergency exit and looked up at the tower and realized we were at war. I remained at the police desk until Two World Trade Center collapsed without warning, trapping me and the officers at the police desk. We thought the loss of power accompanied by this tremendous roar was a secondary attack, a bomb. After we finally escaped, I made my way to the police command post on West Street, and it was only as I walked west on Barclay Street, that I realized through the smoke that Two World Trade Center had collapsed. At the Port Authority Police's request, I then returned to the vicinity of 6 World Trade Center to assess the condition of One World Trade Center with then-Captain Whitaker, commander of the PA Police at the WTC, just as the tower began to collapse. We were both enveloped by this churning black debris cloud as we ran north on West Street. It was darker than any burning building I have ever been in as a volunteer fireman, and it was next to impossible to breathe due to the debris in the air.

PORT AUTHORITY STAFF and THEIR ACTIONS

Mr. Chairman, the employees of the Port Authority have a long history of distinguished public service. September 11, 2001, subjected Port Authority staff to a most difficult test. During a time of compelling need, these men and women performed extraordinary acts of heroism and service, and their unerring devotion to the agency highlighted their shared values of duty, loyalty and commitment to the public. Staff from all Port Authority units, not just the World Trade Department, rose to the challenge that day, assisting in the evacuation. Eighty-four members of our Port Authority family perished that day, both civilian and Port Authority Police. There were many of acts of valor that day. I am attaching the write-ups on staff you requested.

RECOMMENDATIONS

Mr. Chairman, the world has significantly changed for everyone as a result of 9/11, and I believe there are still lessons to be learned. Both the NYC and model codes still don't anticipate full high-rise building evacuations during a fire event. The recommendations currently before the NYC Council deal with non-fire events. The

current thinking is still "defend in place and evacuate the fire floor and floors above in danger." In my opinion, people today will not obey an order over the public address system to stay in place. I have had office space in two different buildings in Manhattan since 9/11 as a tenant. In both buildings, minor fires not within Port Authority space took place and there was a mass self-evacuation of the building. I remain in touch with colleagues who run other skyscrapers, such as the Sears Tower, who have experienced the same phenomena. In my opinion, this needs to be recognized by the code officials, and the stairwells widened by at least an extra foot beyond today's code requirements. One of the stairwells in the WTC was wider than what the code required and this proved very beneficial since it allowed two people to come down adjacent to each other while emergency workers ascended. The training and equipment we gave the floor wardens and their teams was beyond what was required by the codes. The studies being done by the National Institute of Science & Technology and Columbia University on the human behavior during evacuation hopefully will lead to better understanding of the relationship between communication and behavior and hence lead to requirements for future fire drill standards. This is necessary to avoid people being trampled to death in the stairways in panic. That it did not happen is a credit to all those people who evacuated the World Trade Center on 9/11. Nevertheless, I have heard stories of people hesitating, waiting for public-address announcements, and heading higher in the buildings. Tenants should understand that stairs may have horizontal passageways and smoke doors, and that they should follow the trailblazing signs.

The importance of power redundancies, not common in other buildings, nor required by codes, needs to be recognized. They, along with the photoluminescent stairwell signs and markings, worked well, as did the battery backed-up stairwell fixtures and exit signs. We have even installed these features in the buildings where we are a tenant at present.

Another item that should be looked at is the elevator code requirement that door restrictors must lock the elevator doors closed when the elevator is not level with a landing. This is a requirement of the current codes, and such devices were being installed as elevators were modernized at the World Trade Center. These devices are meant to improve safety and prevent accidental falls into the shaft, but they have the potential consequence of trapping individuals in an elevator when it is stuck between floors, preventing escapes such as took place in both 1993 and 2001.

Another lesson learned is to have a plan to regroup away from the incident site where headcounts can be taken. It cannot be across the street, but I never suspected it would have to be miles away in Jersey City either.

You also need a company plan on how to handle the notifications to families of employees. We had a plan for PA staff and counselors to make notifications to a family for someone seriously injured or killed. This works appropriately for an industrial accident, and even in the 1993 bombing, but in the 9/11 event we did not know for several days who had survived, who was killed and who was still missing. We set up a number at the Newark Legal Center for staff to call. And slowly, by 4 a.m. the next day,

the number of my own staff was down to 16 missing, out of roughly 150 people. I called the families of each missing person, hoping they had heard something; this went on through the 13th. By that time the Port Authority Human Resources Department had assigned counselors to each family. I had lots of hope that members of my staff who knew the nooks and crannies of the complex would be found in the subgrade areas. Unfortunately they were not. I learned how different each family's reactions were over the first two months with only one body recovered. I had a list of all staff and their home and cell phones on my PC, in my attaché case and, luckily, on my Palm Pilot, using a program called Documents to Go. It proved to be invaluable.

No building or fire safety code can cover every potential terrorist act, some of which we can't even imagine today. I have been told that the energy from one of the planes hitting the tower was equal to the energy released by a tactical nuclear weapon. The forces were just incredible, slicing through steel columns as if they were butter. The towers actually experienced three separate events; the initial impact, the fuel/air explosion and resulting overpressures, and finally a raging fire. If the WTC complex did not exceed codes in so many ways the 9/11 losses would surely have been much more horrific. Therefore, the Port Authority fully supports the 21 recommendations from the New York City Department of Buildings' WTC Building Code Task Force, 13 of which were introduced as recent legislation in the NYC Council. Many of these recommendations come out of the extraordinary improvements that the Port Authority implemented at the World Trade Center, as the New York City Buildings Commissioner testified when the legislation was introduced.

CONCLUSION

The Port Authority staff, including myself, has spent a great deal of time in the last year and a half working with the National Institute of Science and Technology and this Commission to make sure that what happened that day never happens again. Fortifying buildings is a last resort. We must do everything that we can to prevent other Americans from suffering the pain and anguish that the 1993 and 9/11 families suffered. But we also cannot forget that pain and anguish. I have not, and we continue to deal with the families of staff lost in both events. They are in my thoughts and prayers.

Thank you